

## The oil of *Parkia roxburghii* G. Don, a potential insecticide

Extensive use of neurotoxic chemicals for the control of insect pests leads to detrimental effects on the environment, to health problems, as well as to development of resistance to insecticide in many insects. This has persuaded us to investigate the possibility of utilizing plant-derived chemicals. It has been reported that the most promising pesticides are likely to be obtained from the families Maliaceae, Rutaceae, Asteraceae, Annonaceae and Lamiaceae<sup>1</sup>. Legumes are also reported to contain a number of toxic principles<sup>2</sup>. Tree bean, *Parkia roxburghii* G. Don is widely grown in Manipur and its adjoining states, and the pods of this plant have been used, from time immemorial, as a delicious vegetable by the inhabitants of this part of the country. This paper reports the insecticidal properties of this plant.

The seeds of *P. roxburghii* were cut into small pieces, shade-dried, ground in Remi grinder and finally passed through a 30 mesh sieve to get them in powder form. Petroleum ether (b.p. 60–80°C) extract of the powder was made through Soxhlet apparatus. Benzene (5%) was added to the extract as a solvent to make a stock solution. The desired dilution was made with distilled water using 0.5% Triton × 100 as emulsifier in each case. The treatments along with two controls, viz. emulsified water and water alone, were replicated thrice.

For contact toxicity test, fresh leaves of the Indian bean *Lablab purpureus* (Linn.) were collected from the unsprayed field and washed thoroughly with tap water. After drying, each leaf was dipped into a desired concentration of the extract and dried again under a ceiling fan in a Petri dish (15 cm dia.). Twenty healthy aphids were released into each Petri dish and the aphid mortality was counted after 24, 48, 72 and 96 h of the release.

The mean mortality percentages of aphids obtained with various concentrations of *P. roxburghii* under laboratory

Table 1. Toxicity of various concentrations of *Parkia roxburghii* oil extract to the bean aphid *Aphis craccivora*

Concentration (%)	Mean mortality percentage* after			
	24 h	48 h	72 h	96 h
0.1	0	23.33 (28.70)**	43.33 (41.15)	63.33 (52.78)
0.5	10.00 (18.43)	30.00 (33.21)	50.00 (45.00)	76.66 (61.22)
1.0	13.33 (21.14)	36.66 (37.22)	53.33 (46.92)	86.66 (72.29)
1.5	23.33 (28.78)	53.33 (46.92)	73.33 (59.71)	96.66 (83.86)
2.0	33.33 (35.22)	73.33 (59.00)	93.33 (81.14)	100.00 (90.00)
Emulsified water (control)	0	0	0	3.33 (6.14)
Water (control)	0	0	0	3.33 (6.14)
SEm ±	1.52	1.59	4.74	5.48
CD at 5%	(4.69)	(4.99)	(14.60)	(16.89)

\*Average of three replicates.

\*\*Figures in parentheses are averages of transformed values =  $\arcsin \sqrt{\text{percentage}}$ .

conditions are presented in Table 1. For all the concentrations, the percentage mortality was significantly better than the two controls maintained. The percentage kill increased with increase in time and concentration, and *vice versa*. The highest kill was obtained with 2.0% concentration, which reached 100% after 96 h of its application and differed significantly from the other concentrations, except for 1.5% concentration.

The results indicate that the oil extract of *P. roxburghii*, an edible legume of the northeastern region, possesses insecticidal properties and its 1.0–2.0% extract holds promise in controlling a variety of insect pests. The insecticidal properties (Table 1) of this plant are being reported here for the first time.

1. Jacobson, M., in *Insecticides of Plant Origin*

(eds. Arnason, J. T., Philogene, B. J. R. and Morans, P.), ACS Symposium Series, Washington, 1988.

2. Chatterjee, B. N. and Bhattacharyya, K. K., in *Principles and Practices of Grain Legume Production*, Oxford & IBH Publishing Co., New Delhi, 1986, pp. 425–429.

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